Wilms Tumor With Metastasis to the Vagina: A Case Report

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A 12-year-old female presented with abdominal pain, night sweats, weight loss, constipation, dysmenorrhea, menorrhagia, and vaginal discharge. Examination revealed a palpable flank mass and a large tumor adherent to the anterior vaginal wall. Computed tomography scan demonstrated a 23 cm mass in the left kidney, a separate 10.8 cm pelvic mass, and metastatic disease. Biopsies were consistent with Wilms tumor. Neoadjuvant chemotherapy and a left radical nephrectomy were performed for her stage IV disease as the kidney was amiable to complete resection. The patient received radiation and resumed chemotherapy. She was doing well with improved symptoms at follow-up. UROLOGY 101: 151–153, 2017. © 2016 Elsevier Inc.

CASE REPORT

A 12-year-old female presented to the emergency department with worsening abdominal pain, drenching night sweats, a 10 lb weight loss over the past month, constipation, urinary urgency and incontinence, weak stream, dysmenorrhea, menorrhagia, and vaginal discharge. She was recently treated for bacterial vaginosis. The patient was otherwise healthy without medical or surgical history, significant family or social history, and was not taking medications or supplements. Her physical examination found her afebrile with stable vital signs, a palpable and firm left flank mass, and a large protruding tumor adherent to the anterior vaginal wall. The patient had normal external female genitalia and no palpable adenopathy. Laboratory evaluation demonstrated white blood count of 14.7, Hgb of 8.0, hematocrit of 26.1, platelets of 563, Cr of 0.74, albumin of 3.1, and electrolytes that were within normal range, as were her serum human chorionic gonadotropin and alfa fetoprotein. Urinalysis showed red and white blood cells, and urine culture had no growth. An abdominal ultrasound revealed a complex heterogeneous mass with hyperechoic elements measuring 25 cm in the left retroperitoneum and distinct solid homogeneous pelvic mass hypoechoic cystic components. Computed tomography scan of the chest, abdomen, and pelvic with contrast demonstrated a 23 cm heterogeneous mass involving most of the left kidney with a pseudo-claw sign and low attenuation, and a separate 10.8 cm similar-appearing heterogeneous mass in the vagina, along with extensive intra-abdominal, pelvic, and inguinal lymphadenopathy and liver and lung metastasis (Fig. 1A). A non-contrast pelvic magnetic resonance imaging further characterized 5 cystic components (2 large and 3 small) in the pelvic mass (Fig. 1B). Brain imaging and total body scan were negative. Because there was compression of the great vessels by the renal mass, the patient was placed on prophylactic enoxaparin. Image-guided biopsy of the renal mass demonstrated monophasic blastemal Wilms tumor: malignant blue cell morphology with pseudorosette structures and surrounding fibrous connective tissue positive for WT-1 in both the N-terminus and C-terminus on nuclear staining (Fig. 2). Examination under anesthesia and vaginal biopsy confirmed diagnosis of a metastatic Wilms tumor deposit (Fig. 3) as this lesion did not communicate with the primary renal lesion.

Induction chemotherapy with daptomycin, vincristine, and doxorubicin was commenced per regimen DD4A of the AREN0533 protocol.[1] After 6 weeks of chemotherapy, repeat computed tomography scans showed decrease in size of both the renal and vaginal masses at 15.6 and 5.0 cm, respectively, as well as the rest of the nodal and metastatic lesions. The patient underwent left radical nephrectomy with regional lymphadenectomy. The vaginal mass was not addressed surgically to avoid a potential pelvic exenteration and associated morbidity as this was viewed as a metastatic lesion and should respond to chemotherapy. Surgical pathology showed a 15.0 cm Wilms tumor with favorable and blastemal-predominant histology without spillage or violation of Gerota fascia, renal capsule, or adjacent organs. Six of ten resected lymph nodes were involved with tumor, giving the patient localized stage III disease in the setting of stage IV disease.

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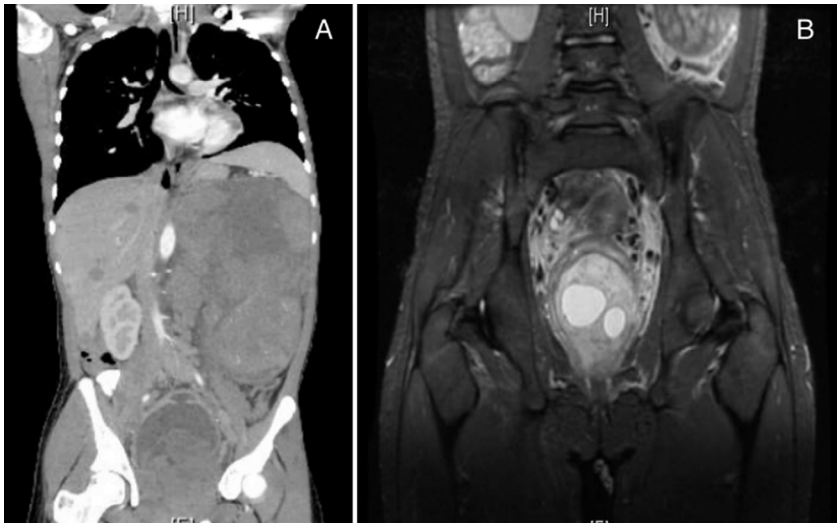

Figure 1. **(A)** Computed tomography scan with contrast showing large left renal and pelvic masses measuring 23 cm and 10.8 cm, respectively, along with metastatic disease. There is displacement of the great vessels. **(B)** Pelvic magnetic resonance image revealing 2 large hyperattenuating cysts within the pelvic mass.

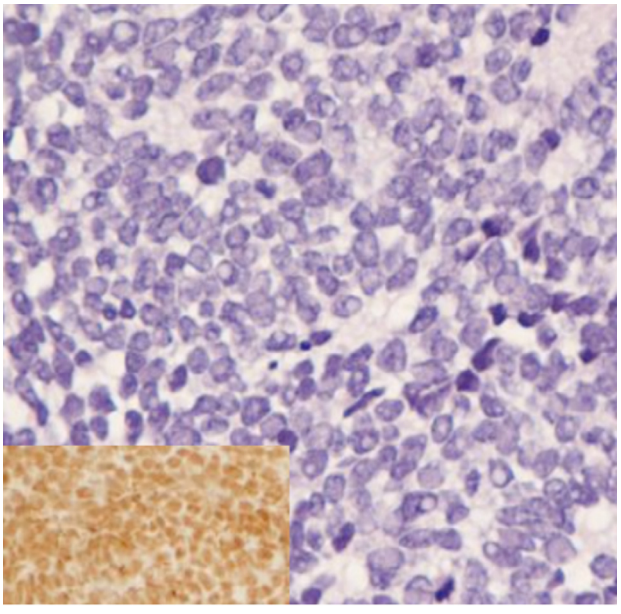

Figure 2. Histologic examination of the left renal biopsy showing blue cell morphology with pseudorosette structures and surrounding fibrous connective tissue consistent with monophasic blastemal Wilms tumor. Insert shows strong diffuse WT-1 nuclear staining with both N-terminus and C-terminus antibodies. (Color version available online.)

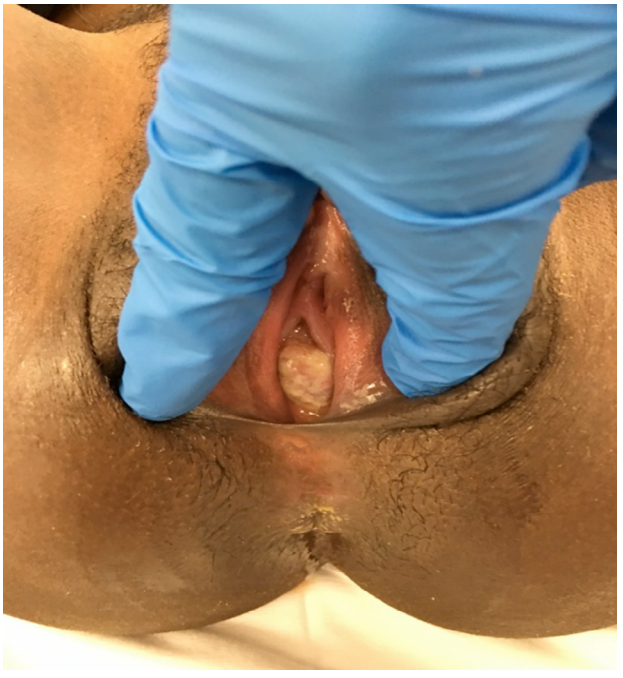

Figure 3. Examination under anesthesia demonstrates a large mass protruding through the introitus which was adherent to the anterior vaginal wall. (Color version available online.)

Postoperatively, the patient underwent a stem cell harvest and received whole body irradiation to the chest, abdomen, inguinal region, and pelvis of 2100 cGy in 14 fractions. She resumed chemotherapy with the addition of cyclophosphamide and etoposide per regimen M as she had improved but persistent disease in the liver and lung.[1] The vaginal mass had decreased to 4.5 cm. The patient was doing well with improved symptoms at 4 months postoperatively, tolerating chemotherapy, voiding and stooling well, and without pelvic symptoms. Therefore, decision was made to continue observation of the vaginal lesion and hold off on debulking surgery for now.

DISCUSSION

Wilms tumor is classically a malignant tumor of the kidneys composed of metanephric blastema, stromal, and epithelial

elements seen in children. To our knowledge, this is the first report of a vaginal mass presenting as metastatic Wilms tumor. When abnormal vaginal findings have been reported in the literature with Wilms tumor, they are in relation to a congenital anomaly (septation, duplication, benign tumors, etc) and are usually associated with mutations in the WT-1 gene or Denys-Drash syndrome.[2-7]

Isolated Wilms tumor of the female reproductive tract has been reported in rare case reports. A 13-year-old girl who presented with vaginal spotting had a vaginal Wilms tumor composed of triphasic tissue with primitive cartilage and skeletal muscle with squamous and columnar epithelium. After surgical excision and chemotherapy, the patient was reported to be disease-free for over 7 years.[8] Wilms tumor was reported to arise from the cervix of a 12-year-old girl presenting with vaginal discharge. Biopsy of a bulky mass confirmed Wilms tumor with favorable histology; chemotherapy with vincristine, doxorubicin, cyclophosphamide, carboplatin, and etoposide led to significant reduction of the mass facilitating transection at the stalk and cold-knife conization of the cervix yielding her in complete remission at 12 months.[9] Another 13-year-old girl with isolated cervical Wilms presented with a polypoid mass attached to the endocervix by a stalk. The biopsy showed blastemal, epithelial, and stromal elements. Although the patient was not given organ-sparing therapy, she is reported to be disease-free for over 9 years after hysterectomy.[10]

Wilms tumor of the uterus was first reported in 1974 in a 14-year-old girl admitted with abdominal cramping and vaginal bleeding since menarche 1 year prior. Physical examination showed a large tumor involving the vagina and pouch of Douglas. Laboratory examination was normal aside from moderate anemia. The patient was treated with hysterectomy with culdotomy followed by adjuvant chemotherapy, and remained disease-free after 5 years of follow-up. Histologic examination of the tumor showed embryologic tubules, glomeruli, and blastema within a myxomatous stroma.[11] Wilms tumor has also been seen in the uterus of patients as old as 44 years, such as one presenting with a bleeding polypoid cervical mass, and after hysterectomy followed by chemotherapy was disease-free at 1 year.[12] Uterine Wilms has been noted in 3 other patients, 2 adolescents as polypoid masses protruding through the cervix, and a 22-year-old presenting with menometrorrhagia. Triphasic differentiation with mesenchymal cells showed rhabdomyoblastic and epithelial differentiation, and most of the tumors was composed of blastemal cells.[13]

CONCLUSION

Extrarenal Wilms is extremely rare but appears to clinically behave similarly to renal Wilms. This is the first report of a vaginal mass presenting as a metastasis of renal Wilms tumor. The clinical course and prognosis of Wilms metastatic to the vagina have yet to be determined.

References

1. Dix DB, Gratias EJ, Seibel N, et al. Treatment of stage IV favorable histology Wilms tumor with incomplete lung metastasis after chemotherapy: a report from Children's Oncology Group study AREN0533. *J Clin Oncol*. 2014;32:5s.
2. Berdugo J, Gauthier P, Provencher D, et al. Spindle cell epithelioma of the vagina: report of two cases, literature review, and new immunohistochemical markers. *Int J Surg Pathol*. 2015;23:677-681.
3. Cho HY, Lee BS, Kang CH, et al. Hydrothorax in a patient with Denys-Drash syndrome associated with a diaphragmatic defect. *Pediatr Nephrol*. 2006;21:1909-1912.
4. Lee HJ, Yeom JS, Park JS, et al. Denys-Drash syndrome, septated vagina and low level of anti-Mullerian hormone in male neonate. *Ann Pediatr Endocrinol Metab*. 2014;19:100-103.
5. Nakamura Y, Nakashima T, Nakashima H, Hashimoto T. Bilateral cystic nephroblastomas and botryoid sarcoma involving vagina and urinary bladder in a child with microcephaly, arhinencephaly, and bilateral cataracts. *Cancer*. 1981;48:1012-1015.
6. Suri M, Kelehan P, O'Neill D, et al. WT1 mutations in Meacham syndrome suggest a coelomic mesothelial origin of the cardiac and diaphragmatic malformations. *Am J Med Genet A*. 2007;143A:2312-2320.
7. van Lingen BL, Reindollar RH, Davis AJ, Gray MR. Further evidence that the WT1 gene does not have a role in the development of the derivatives of the müllerian duct. *Am J Obstet Gynecol*. 1998;179(3 Pt 1):597-603.
8. Song JS, Kim IK, Kim YM, et al. Extrarenal teratoid Wilms' tumor: two cases in unusual locations, one associated with elevated serum AFP. *Pathol Int*. 2010;60:35-41.
9. Iraniha S, Shen V, Kruppe CN, Downey EC. Uterine cervical extrarenal Wilms tumor managed without hysterectomy. *J Pediatr Hematol Oncol*. 1999;21:548-550.
10. Bell DA, Shimm DS, Gang DL. Wilms' tumor of the endocervix. *Arch Pathol Lab Med*. 1985;109:371-373.
11. Bittencourt AL, Britto JF, Fonseca LE Jr. Wilms' tumor of the uterus: the first report of the literature. *Cancer*. 1981;47:2496-2499.
12. McAlpine J, Azodi M, O'Malley D, et al. Extrarenal Wilms' tumor of the uterine corpus. *Gynecol Oncol*. 2005;96:892-896.
13. Benatar B, Wright C, Freinkel AL, Cooper K. Primary extrarenal Wilms' tumor of the uterus presenting as a cervical polyp. *Int J Gynecol Pathol*. 1998;17:277-280.